DIDO Jr.*TM*
Installation Manual

Manual Number 090501
Firmware Version 1.17 above

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1 Introduction

The DIDO Jr. is a high quality video processor engine. The DIDO Jr. supports advanced functionality such as video format /scan rate conversions, real time image rotation (patents pending), and window effects. All these can be controlled via IR remote and RS-232 commands. The device is small enough to fit in tight areas. The progressive output(s) produces a high quality image using the latest 3:2 / 2:2 pull-down, motion handling, and noise reduction technologies.

- Up to 165MHz bandwidth on the inputs and outputs.
  Allows resolutions up to 1900 x 1200 @ 60Hz (narrow band sync) and can de-interlace 1080i to 1080p
- Image enhancing capabilities including Motion Adaptive De-interlacing, Low-angle Directional Interpolation, 3:2 & 2:2 inverse pull-down, Moiré cancellation, color correction, adaptive flesh tone adjustments, image zoom & shrink.
- The powerful AARE (Aurora Advanced Rotation Engine) / Picture-and-Picture (PAP) engine offers several modes of operation including:
  1. Hi-resolution Dual Image or Side-by-Side (split screen) images. Perfect for teleconferencing, security, command and control applications.
  2. Image Rotation (for digital signage)
  3. Translucent Overlays to maximize main image size while still seeing PiP
- Accepts digital and analog video inputs through a combination DVI/ RGBHV/ YPbPr connectors and S-Video/Composite input connectors
- Internal Event Scheduler with Real Time Clock allows AARE special effects to be scheduled locally and among DIDO Jr. units when connected via the RS-485 bus
- Firmware upgradeable. New firmware releases can be easily uploaded to the DIDO Jr. with the Flash utility, which is available for free from Aurora's website.

Example Setup using the DIDO Jr. side by side mode:

Just a few examples of the DIDO Jr.'s capabilities:

Single Image Scaling

Side by Side

Single with PiP

Single with Translucent PiP

Single Rotated

Dual Rotated

Single Rotated PiP

Single Rotated Translucent PiP

Video Wall Mode Rotated Using 3 DIDO Jr. Units

2   Accessories

Supplied accessories:

    1 - 12V / 14.4W DC wall power supply or International Supply Kit if applicable
    1 - S-Video to Composite Video Adaptors
    1 - RS-232 Adaptor Cable (6 Pin Mini-Din to 9 Pin D-Sub)
    1 - IR Remote

All supplied components are shown on the picture below:

12V / 15W Supply   International Supply with Adaptors

S-Video to Video Adaptors   RS-232 Control Cable   IR Remote

2.1   Optional Accessories

Optional accessories available from Aurora Multimedia:

SRK-001 Single Rack Mount Kit

DRK-001 Dual Rack Mount Kit

CA0020-1 DVI-I to DVI-D / VGA Adapter Cable

CA0022-1 DVI-I to DVI-D / RCA Adapter Cable

CA0021-1 DVI-I to DVI-D / BNC Adapter Cable

DIDO LOOP KIT RS-485 Loop Through Kit for connecting multiple DIDO Jr. units

CA0017-6 200MHz 6ft DVI-I to DVI-D / VGA(15pin D SUB) Breakout Cable

CA0016-6 165MHz 6ft DVI-I to DVI-D / 5 BNC Breakout Cable

3 IR Remote and basic key functions

The DIDO Jr. can be controlled using an IR remote control, via the front panel, or RS-232 commands. The remote is addressable for installing with multiple DIDO Jr. units. To change the address on the remote:

> - Press and hold the 'Up' and 'Down' arrows together for 5 seconds. The red LED will start to blink
> - Enter the address (0-255) and press 'Select'

In order for the IR remote to properly control a DIDO Jr., both devices (IR remote and the DIDO Jr.) have to have the same address. See System Setup Menu for more information on how to change the DIDO Jr.'s address.

For details of DIDO Jr. operation, refer to the corresponding chapter of this document.
Below is a brief description of the remote transmitter and the keys used for DIDO Jr. control.

IR Remote	Function
POWER	Toggles Power On and Off
ZOOM	Brings up Zoom selection for each window 0-100%
CROP	Brings up Crop selection for each window 0-100%
POS	Brings up Position selection for each window 0-100%
SIZE	Brings up Size selection for each window 0-100%
VOLUME +	Not Available for DIDO Jr.
VOLUME -	Not Available for DIDO Jr.
MUTE	Not Available for DIDO Jr.
ARROWS	Moves the cursor up/down/left/right when Menu is active
MENU	Displays Main Menu
SEL	Selects option in Menu
	Finishes input in dialog panels
EXIT	Exits 1 menu level
0..9, DIGITS	Enters digits when dialog menu is active.
INFO	Displays current input/output timings and FW version
ROTATE	Rotates output image by 0, 90, 180, 270 degrees
DVI A	Selects DVI Side A Input
RGB A	Selects RGB/YPbPr Input
VIDEO A	Selects Video/S-Video Input
DVI B	Not Available for DIDO Jr.
RGB B	Not Available for DIDO Jr.
VIDEO B	Not Available for DIDO Jr.
SINGLE	Selects 1 window on the output
DUAL	Selects 2 windows on the output
TRI	Not Available for DIDO Jr.
QUAD	Not Available for DIDO Jr.
SWAP	Swaps the sources between the windows
FREEZE	Freezes the current window
PRESET KEYS	P1 – P4 selects the stored preset

4   Quick Start Guide

1. Make sure the DIDO Jr. and the Display are both disconnected from power.
2. Connect the DIDO Jr. to the Display's DVI, VGA, or YPbPr port as required.
3. Connect the appropriate video sources to input connectors of DIDO Jr. (see "Connections" chapter for details).
4. Connect the power source to the Display (refer to Operating Instructions of the Display).
5. Connect the supplied 12v DC adapter to the DIDO Jr. and the power outlet. The LCD will light and after 5 seconds, the firmware rev will appear. About 15 seconds later, the DIDO Jr. will complete initialization and display the output resolution and format on the LCD. The last settings of the DIDO Jr. will take effect.

5 LCD / Keypad

The LCD helps to navigate through menus with the front keypad.

- **Menu**: brings up the menu on the screen and the LCD - exits menu levels.
- **Selec**t: brings up next menu level or confirms an entry.
- **Arrows**: navigates through the menus and changes selections.
- **Power**: Toggles the Power On and Off. This button can also be used to restore all default values if it's held down for 10 seconds when the power connector is first applied. Factory default for the output is RGBHV XGA 60Hz.
- **Presets**: Holding the select key and pressing the up arrow key will trigger preset 1, right is preset 2, down is preset 3, and left is preset 4.

Note: Restoring default values will delete all saved settings.

When no OSD (Menu) is present, the 'Up' and 'Down' arrow keys will show the status of different functions such as output resolution, layout, input source, etc. The 'Right' and 'Left' arrow keys can be used to scroll the text that can not be seen on the LCD.

6 Connections

The DIDO Jr. has 3 independent inputs and 2 outputs. In addition, there is an RS-232 control port.

6.1 A/V & Control connectors

- CONTROL: RS-232 connection and RS-485 loop through to control multiple DIDO Jr. units.
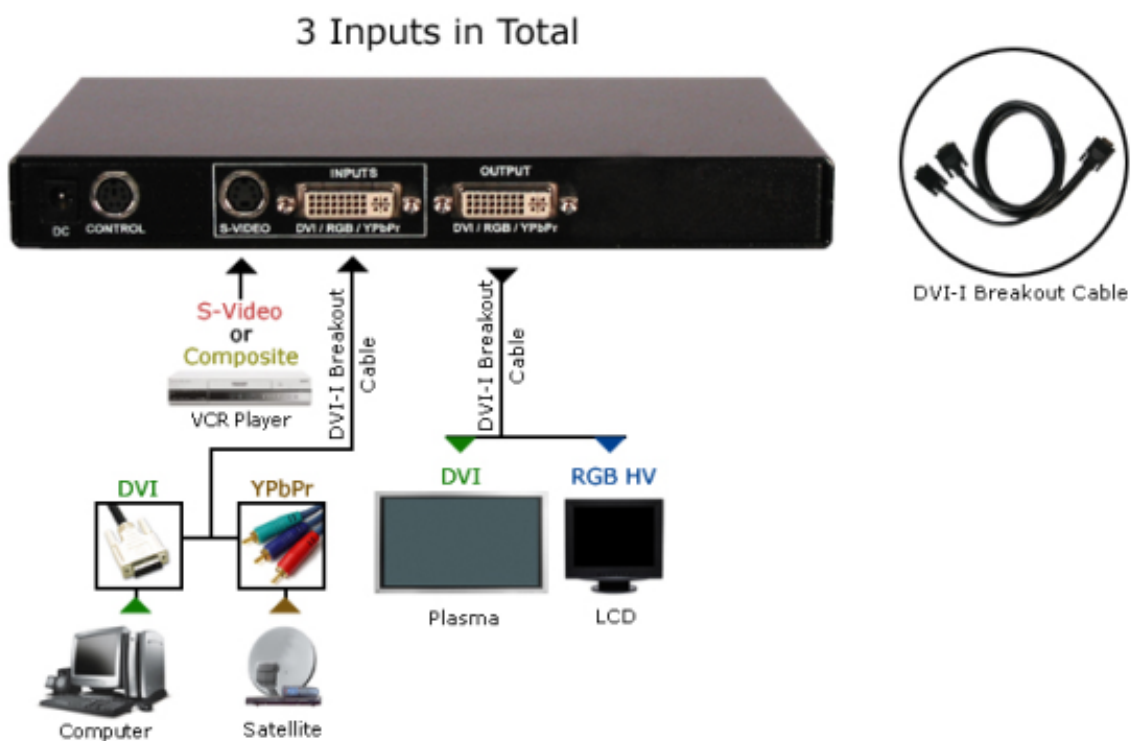- S-VIDEO (4-pin mini DIN): S-Video or Composite (supplied adaptor) input.

- DVI/RGB/YPbPr: for hi-res inputs. If a DVI-I breakout cable is used, RGBHV/YPbPr can be input as an additional source to the DVI.
- DVI/RGB/YPbPr OUTPUT for hi-res outputs. If a DVI-I breakout cable is used RGBHV/YPbPr can be output in addition to the DVI.

6.2 Power connector

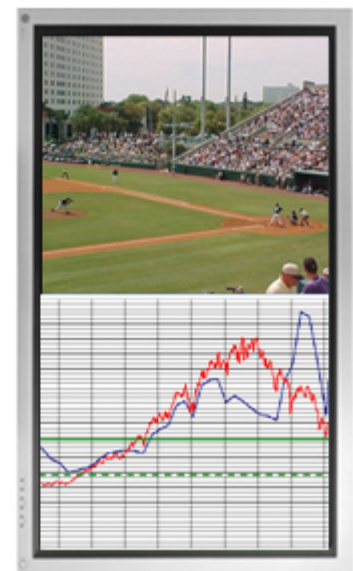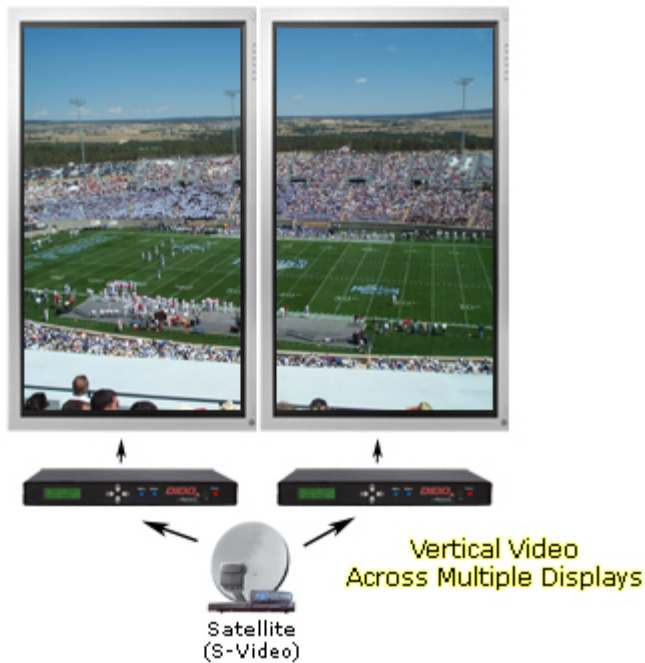Connect the supplied 12V DC adapter to the power jack of the DIDO Jr. unit.
It is recommended to connect the power supply only after all other connections are done.

6.3 Examples Connections

Video Source

DVD Player

DIDOS
in Video
Wall Mode

Horizontal Video
Across Multiple Displays

Vertical Video
Across Multiple Displays

Satellite
(S-Video)

Dual Image Rotation
(Two Images up to 1900 x 1200 Each Input)

7 Operating the DIDO Jr.

The DIDO Jr. has many advanced features to enhance the typical viewing experience. A user can switch the unit on or off, switch the current source, rotate an image, and many other functions.

Advanced functionalities may differ in some of the operating modes, which will be described in more details and in the subsequent chapters of this document.

7.1 Remote Control Functions

Key: Vol+/-
Not available for DIDO Jr.

Keys: 0-9
Used for direct number entry for menu items such as presets, zoom, size, position, etc.

Key: Menu
Displays the Main Menu (see the Menu System chapter).

Key: Sel
Enters selections / confirms changes in the menu.

Key: Exit
Exits one level in the menu or turns off OSD that's being displayed.

Key: Power
Toggles the power on/off.

Key: Rotate
Rotates output image by 0, 90, 180, and 270 degrees.

Key: Swap
Swaps input sources between window 1 and window 2 when the DIDO Jr. is in PiP or SBS mode.

Keys: Info
Displays current sources, input / output timing information, and FW version via OSD. This information will be displayed for 5 seconds.

Key: Freeze
When pressed, it stills the current image on the screen. Pressing again will resume motion.

Keys: Zoom, Crop, Pos, Size
When pressed, it will bring up a menu to select the window to be adjusted. All these selections have a range of 0-100 percent with tenths of a percent accuracy for a total of 1000 points of precision adjusting.

- Zoom: enlarges or shrinks the output image.
- Crop: is specific to an input and is used when under scanning an image to remove unwanted areas around the border. It helps balance the inputs with each other.
- Size: is used to separately adjust of the horizontal and vertical size of an output image.

- Position: moves the window up/down or left/right. Position will only work if the image is zoomed.

Keys: Single, Dual, Tri, Quad

These keys select picture layout (how many windows will be displayed) of the output.
- Single: only one picture is displayed on the output.
- Dual: toggles between PiP and SBS. When in PiP mode, translucency can be adjusted using Up/Down arrows (no menus are present).
- Tri: Not available for DIDO Jr.
- Quad: Not available for DIDO Jr.

Keys: Side A/B DVI, RGB, VIDEO

The three A source keys will select the source to be displayed on the screen. In Single mode, the keys select the source immediately. In Dual mode a dialog will appear asking for window selection.

Keys: P1-P4

Preset keys make the usability of the DIDO Jr. much easier. When a preset is recalled, it will restore the saved screen conditions set at the time of initially saving the preset. Up to 99 presets can be saved and recalled via the menu or RS-232. Only the first 4 can be recalled with the quick keys on the remote. Presets are very useful for effects, image resizing, and especially video wall functions. Presets 1-4 can also be recalled via the front keypad.

7.2   Menu Structure

The menu system allows a user to control various configurations of the DIDO Jr.
For all menus, Up/Down arrows move the cursor (yellow highlighted selection) up/down. Central key (SEL key) selects the current submenu/option, confirms changes, and finishes text entry (passwords, presets, etc.). Left/Right arrows change the currently active option, if possible.

The sub-menus will be discussed in more details in the subsequent chapters.

7.2.1   Main Menu

Main Menu contains the branches to all sub-menus. All different features can be accessed from this Main Menu.

7.2.2 Window Setup

This is where s*ource, size, position, zoom*, and *crop* can be modified per window. Once selected, the choice of window for modification will appear. Window Setup affects the characteristics of the window itself and not the image inside the window.


Source allows input signal to be assigned to a specific window. For example, the menu below shows that DVI is assigned to window 1 and Video input is assigned to window 2.


Window Size gives the ability to change the horizontal and vertical sizes of a window.

Window Position gives the ability to independently change the horizontal and vertical positions of a window. Note that to move a window, the size of that window must be smaller than the active area.
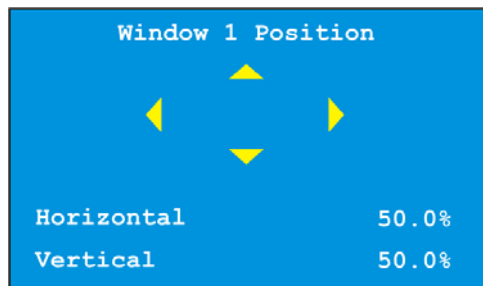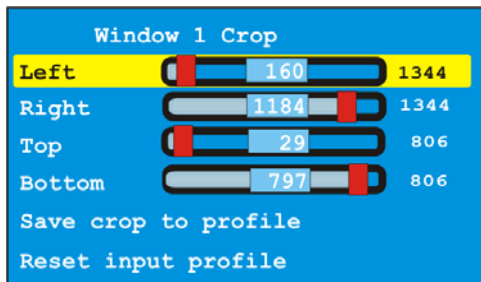
Window Zoom gives the ability to proportionally change both the horizontal and vertical sizes of a window.

```
         Zoom Config
  Zoom window 1  (⬤      50.0%      )
  Zoom window 2  (⬤      50.0%      )
```
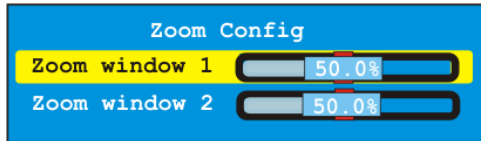
Window Crop allows each of the edges of an image to be adjusted into the window to help reduce noise specific to an input. Crop is specific to the current resolution of the input inside the window. It must be saved into a profile in order for it to be automatically applied. If a new resolution is applied, crop must be re-adjusted. Crop is best for video images that have noisy borders. If the arrow key is pressed once, the value will change by one pixel. If an arrow is pressed and held for 2 or more seconds, the value will change by 10 pixels instead.

Note: For Window Size, Window Position, and Window Zoom, there are 1000 points of accuracy. If the arrow key is pressed once, the value will change by tenths of a percent. If an arrow is pressed and held for two or more seconds, the value will change by 1 percent instead of tenths.

```
       Window 1 Crop
 Left      (⬤    160     )  1344
 Right     (     1184  ⬤ )  1344
 Top       (⬤    29      )  806
 Bottom    (     797   ⬤ )  806
 Save crop to profile
 Reset input profile
```

Video wall setup allows quick setup of a multiple monitor system. Enter the total number of columns and rows as well as the row and column of the one that's being setup followed by apply changes. The output will be changed to the appropriate size. It is still necessary to account for the bezel size of the display device by manually changing the zoom, size or crop. When done, make certain to save in a preset.

```
 Number of columns      1
 Number of rows         1
 Column                 1
 Row                    1
    Apply changes
```
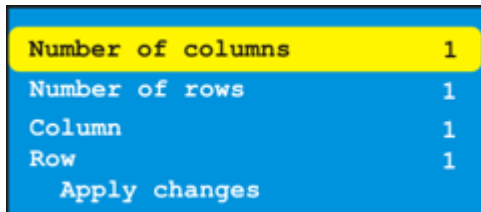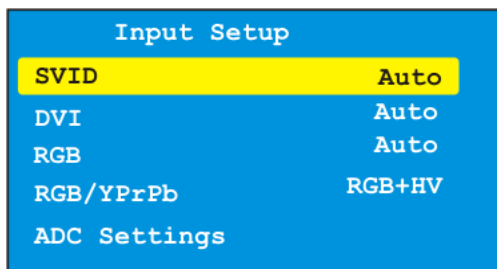
7.2.3 Input Setup

Input Setup allows a user to manually configure different connector inputs.

SVID: Auto, S-Video, and Video. If the image can not lock well due to poor sync, use the manual selection.

DVI: Auto, Norm PC, Wide PC, and Video. The manual selection helps to set correct input timing such as Video or PC. This will help the DIDO Jr. to better sync on an input.

RGB: Auto, Norm PC, Wide PC, and Video. The manual selection helps to set correct input timing such as Video or PC. This will help the DIDO Jr. to better sync on an input.

RGB/YPbPr: RGBHV, RGsB, and YPbPr. Select the type of signal connected to the RGB input.

```
        Input Setup
  SVID                Auto
  DVI                 Auto
  RGB                 Auto
  RGB/YPrPb         RGB+HV
  ADC Settings
```
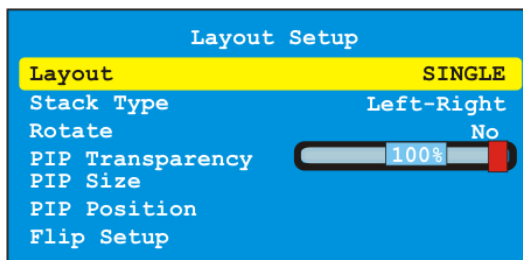
ADC Settings currently has phase control as the selection. It is used to reduce noise on the YPbPr input due to the cable or other factors and to correct the phase of H/V syncs of RGB input.

```
        ADC Setting
  Phase Sensitivity      Standard
  ADC Phase Correction      29
```
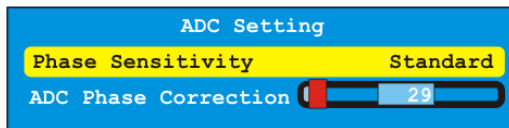
7.2.4 Layout Setup

The *Layout Setup* menu determines the way the windows are positioned and how many windows are displayed.

```
        Layout Setup
  Layout              SINGLE
  Stack Type        Left-Right
  Rotate                  No
  PIP Transparency      100%
  PIP Size
  PIP Position
  Flip Setup
```

Layout selects window layout from Single, PiP, and Dual

Stack Type selects the positions of windows 1 and 2 in Dual mode. The selections are Left-Right and Up-Down.

      Left-Right Dual Mode   Up-Down Dual Mode

Rotate will rotate picture by 0, 90, 180, and 270 degrees.
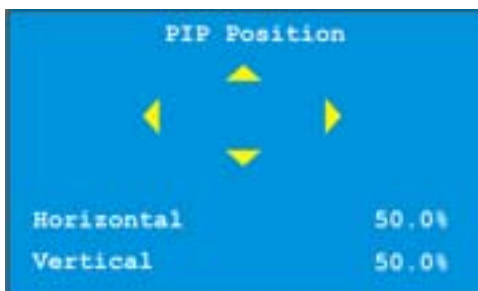
PiP Transparency sets the transparency level (16 levels) of the pip window when in PiP mode.
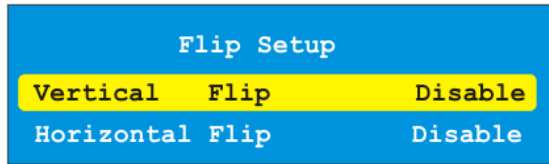

PiP Size adjusts the size of the PiP window from 0 - 100 percent with accuracy down to the tenths.

PiP Position adjusts the position of the PiP window from 0 - 100 percent with accuracy down to the tenths.

Flip Setup changes the input image orientation with respect to the output. This allows for mirror images or back to back images in rotated modes to create new effects.


Horizontal Disabled   Horizontal Enabled

7.2.5 Output Setup

Output timing for the DVI/RGBHV/YPbPr connector is selected here. Output type can also be modified from this menu for the analog portion of the connector. The selections are RGBHV, RGsB, YPbPr, and No Output.
*HDCP Output* gives the ability to always have HDCP enable or the DIDO will decide when to enable and disable the HDCP.
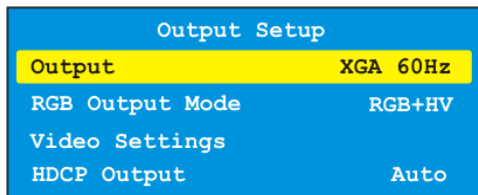
Video settings adjust the brightness, contrast, saturation, and hue of picture output. All windows will be affected when adjusted.

7.2.6 Preset Setup

This menu allows the saving and loading of up to 99 presets. To save or load a preset, select Load Preset or Save Preset. Then change preset number to be saved or loaded. Press "SEL" to confirm changes. If it is saving, the OSD will display "Preset is being saved". Presets can take up to 2 seconds to load. So if only simple switching sources is needed, use the keys or RS-232 commands for quicker changing of inputs. Presets are great for a starting point when many things need to change at once as it stores everything such output resolution, modes, input setup, video settings etc.

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```
                Save
  Preset#                    1
```
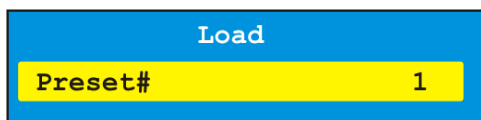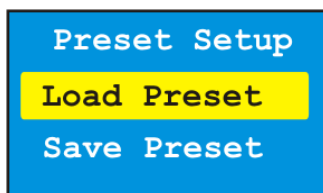
7.2.7 System Settings

This menu allows the selection of items which affect the overall DIDO Jr. operation.

```
            System Setup
  Unit Address
  Baud Rate               115200
  OSD Setup
  Noise Reduction
  ADC Calibration
  Background Color
  DIDO Reconfig
  DEFAULT SETTINGS
```
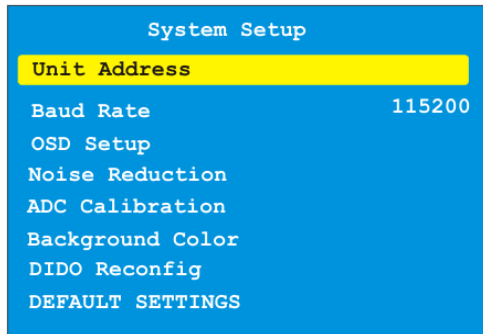
Unit Address allows many DIDO JR units to be connected via RS-485. When connecting multiple DIDO JR units via the RS-485, each unit must be addressed differently. This address will be used when controlling via RS-232 from a control system or PC. In addition, the last unit in the chain must have RS-485 Termination enable.

The IR remote is also addressable (see IR remote section) and if set to the same address as the DIDO JR, it will control only that DIDO Jr. This feature is very useful when multiple DIDO JR units are present to prevent inadvertently controlling other units.

```
            Unit Address
  DIDO Addredd            0
  IR Remote Query
  RS-485 Termination     Off
```
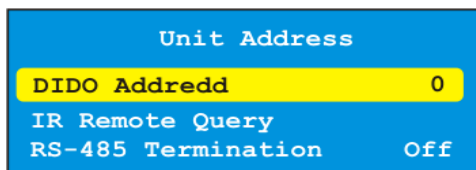
Remote Query is a diagnostic tool used to check for any DIDO Jr. remote's current address even if it is not matched to the address of that DIDO Jr. unit.

```
       Press "SEL" button on
   the chosen IR remote controller


               OK
```
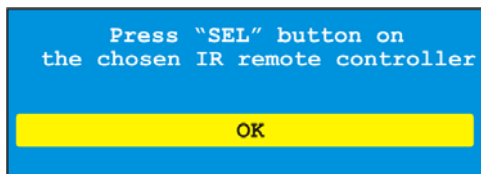
OSD Setup turns on/off the Menu Transparency and OSD.

Menu Transparency allows the menu to blend with the background.

Show OSD can disable the On Screen Display. When using the front keypad for setup via the LCD, it will prevent the OSD from coming on the screen. This is handy when making changes to the system while it is being viewed.


*Background Color* determines the color of the window when no input signal is present.

Noise reduction allows the DIDO Jr. to clean up an image with random noise caused by poor or weak signal. There are two types of noise reduction filters available. The first one is "Spatial Filter" which is good for signals from poor TV reception. The second one is "Temporal Filter" which is a good overall noise reduction to clean up an image. There is a penalty when using noise reduction which is the softening of the image. Best way to use noise reduction is trial and error to see what works best for the application.

Motion handling is for DIDO Jr. Motion Adaptive De-interlacing. There are three options to choose from. Option 2 gives the best overall compromise of feathering and jitter when enabling this feature. Once again, it is best that different options are used with the content to see which works best.

Scaling Filter is for the graphics channel. This should be enabled in most cases especial when an image is being down scaled or reduced in sized. The scaling filter is not used when an image is up scaled or increased in size.
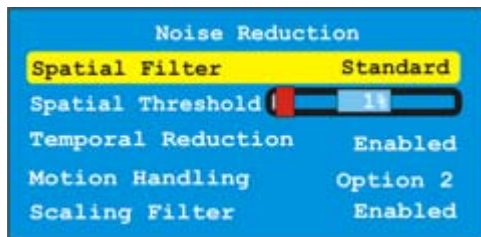
ADC Calibration is for the RGBHV inputs color settings. The Auto will automatically adjust the gain and offset for each color when a test pattern is inputted. The Manual allows adjustment to a user's reference or with external color analyzer.
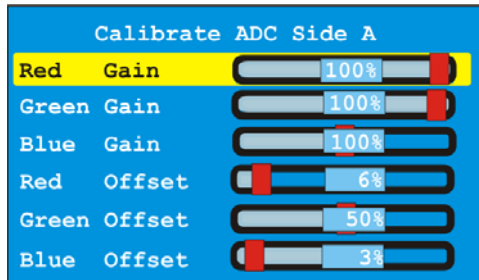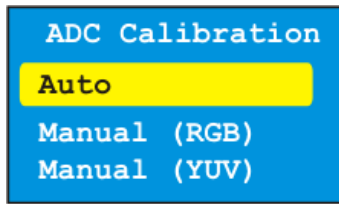
DIDO Jr. Reconfig will re-sync all the current input signals as if the inputs were disconnected and reconnected.

Default Settings will reset the DIDO Jr. to factory settings (default settings). All customized settings will be deleted.

8   Signal Timing

This menu allows the adjusting and adding of input and output resolutions. There are currently ten user profiles for customized input and output resolutions. Horizontal Frequency and Pixel clock are automatically calculated inside the DIDO Jr. When done making changes, select Apply Changes to save. Keep in mind any change made affect all inputs using the resolution as well as outputs.

WARNING: When making custom resolutions, make sure the device that accepts the signal is capable of handling it. Failure to do so may result in damage in some devices. Consult the User Manual before applying new resolutions with different frequencies.

8.1.1   Timer and Scheduler

The timer scheduler is great for display signage. The DIDO Jr. has a built in real time clock which has backed-up battery. This menu allows for the time and date to be set as well as two types of scheduling.

Current Date and Time is important to the operation as the accuracy of the scheduler is based upon the settings in this menu. If the region the DIDO Jr. is located in has daylight savings then it should be turned on to keep the time correct throughout the year.

Time Events are events based on the time of day. The DIDO Jr. can have 5 different time events programmed.

```
  Time Events Editing
Time Event 1
  Time Event 2
  Time Event 3
  Time Event 4
  Time Event 5
```
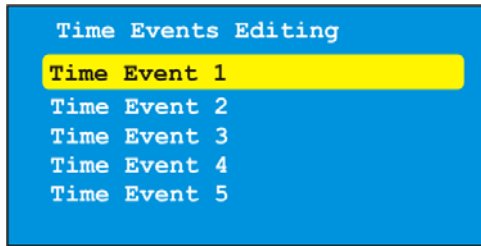
When the an event is turned on, the time selected will cause the DIDO Jr. and all other DIDO Jr. units connected on the RS-485 bus to carry out a preset, power on, or power off.

```
  Time scheduler event 1
Event                 Off
  Time            00:00am
  Type           Power ON
  Preset                0
```

Timer Events are events based on a cycling time line. This means the DIDO Jr. will carry out repeating functions in a timeline. The DIDO Jr. can have 5 different timer events programmed.

```
  Timer Events Editing
Timer Event 1
  Timer Event 2
  Timer Event 3
  Timer Event 4
  Timer Event 5
  Start Timer
```
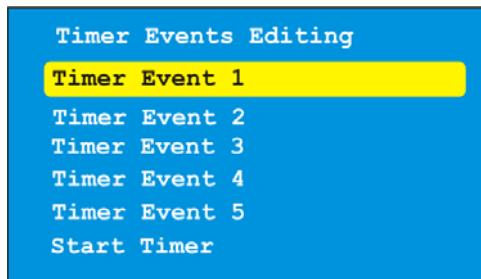
When an event is turned on, the timer selected will cause the DIDO Jr. and all other DIDO Jr. units connected on the RS-485 bus to carry out a preset, power on, or power off.

```
  Timer scheduler event 1
Event                 Off
  Time           00:00:00
  Type           Power ON
  Preset                0
```
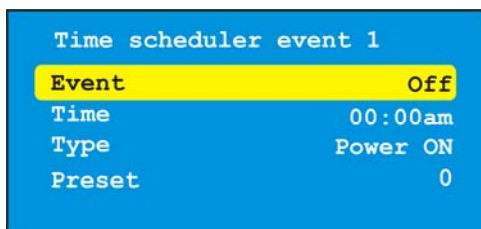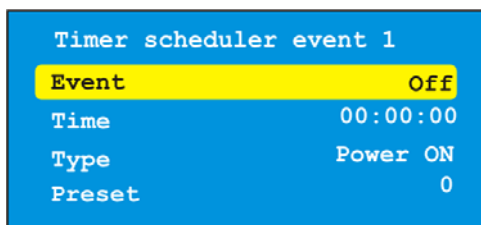
If multiple DIDO Jr. units are used, the schedulers can be used in all units to gain more events. It is not necessary to program all DIDO Jr. units with the same events as they will conflict (time conflict) with each other. However, if they are programmed at different times, it will work properly with no conflict.

Video Wall Functionality

When multiple DIDO Jr. units are used, a very powerful but yet cost effective video wall can be created. The DIDO Jr. can create video walls that have real time vertical rotation of single or multiple images. For easy setup, the DIDO Jr. has a Video Wall Setup menu under Windows Setup. This menu allows a user to enter the amount of rows and columns of the video wall as well as the current location of the DIDO Jr.. Once entered, the DIDO Jr. will calculate the proper size for the unit which can then be saved into a preset.

Example of 2x2 Video Wall Settings:
For this example, 4 DIDO Jr. units will be needed. The output of each DIDO Jr. will be connected to a display that's assigned to that specific DIDO Jr.. The source to be shown across the four displays will need to be put through a distribution amplifier (D/A) to feed the same source into the four DIDO Jr. units. From Video Wall Setup of each DIDO Jr.:
-   Set number of columns and rows to 2 (2x2).
-   Set column and row of each DIDO Jr. to its corresponding quadrant. In 2x2 mode, if column and row are set to 1, then this DIDO Jr. will display the 1st quadrant. If column is set to 2 and row is set to 1, then this DIDO Jr. will display the 2nd quadrant and so on.

Note on video wall setup:
-   Input the highest possible resolution because it will produce a better picture on the output (the output picture will not be zoomed as much).
-   Avoid using composite video sources as the dot crawl will be magnified. S-Video, YPbPr, RGBHV, and DVI are the better choices with DVI providing the cleanest picture.
-   Use the DVI output of the DIDO Jr. units because it will keep the image clean and sharp.
-   Match the output resolution of the DIDO Jr. to the displays native resolution.

Wire the RS-232/485 as per the connection diagram located in the back of the manual and set the address in each DIDO Jr. unit so they are different from each other. This will help when using presets, IR remote control, and RS-232 control. The DIDO LOOP KIT can be purchased separately for easy connections.

Ideally a video generator should be present with a grid pattern to set each DIDO Jr. unit to the appropriate quadrant. When using the grid make certain all the boxes are square even though the screens may be rectangular. Also, make certain the display device has all zoom modes and aspect controls set to default positions. Using the Zoom, Size, Position, and Crop to adjust and center the picture and store it in a preset. Even though each DIDO Jr. unit will be zoomed to a different area of the original image, it is best to store it to the same preset as all the other units. When that preset is recalled, all units will go to the appropriate area they were set for. Repeat this for each source and each effect desired.
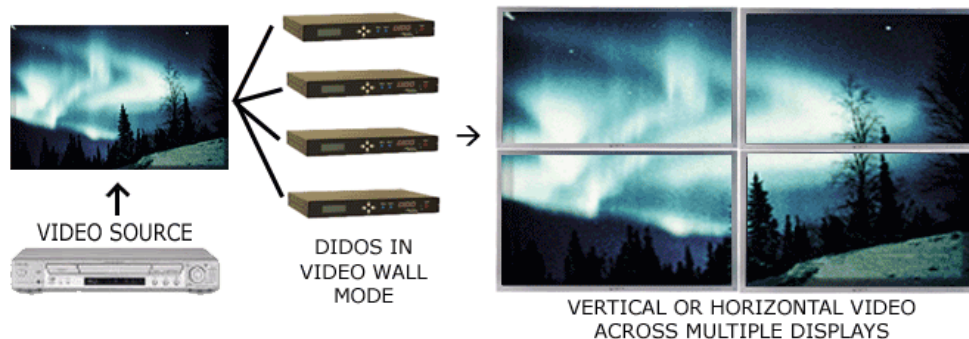

Depending on input and output resolutions, video walls up to 32 x 32 can be created. Video walls with rotated images can be created as well with a combination of both rotated and non-rotated to create a puzzle effect.

9 Real Time Image Rotation

The DIDO Jr. can do real-time image rotation with resolutions up to 1900 x 1200 @ 60Hz. Its patent pending multi-image rotation allows a display to show multiple rotated images at the same time.

These examples below show some of the many possibilities.

Single Rotated   Dual Rotated   Rotated PiP   Single Rotated Translucent PiP
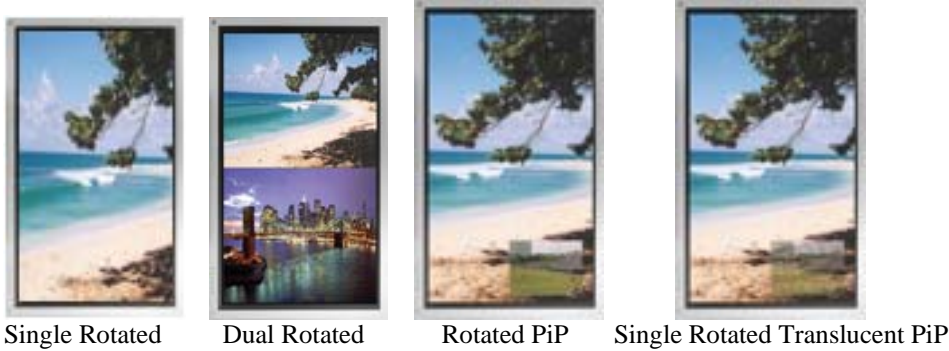
Images can be cropped and zoomed for stretch to fit. The edges can also be cut off to show only the middle for runway effects and thus keeping the image proportional.

Rotated flat displays have many benefits as listed below:
1) Two images can be displayed one on top of another to create two nearly 4:3 images.
2) In a presentation with images are rotated vertically, the presenter will not block any image on the screen. With a horizontal display doing side by side images, it's most likely that the image closer to the presenter will be blocked.
3) Vertically rotated pictures can help preventing burn-in image on plasma display. With horizontal display doing side by side, the top and bottom usually have black areas to keep the image proportional. These black areas, if stay on for a long time, will cause the phosphor to burn unequally.

As there are benefits to having rotated displays, a user may also want to still be able to show a display horizontally. There are companies that make rotating wall mounts that can be operated manually or motorized.

Display Devices manufactures motorized wall mounts for plasma and LCD displays. Check out www.displaydevices.com for more info.

10 Control Software
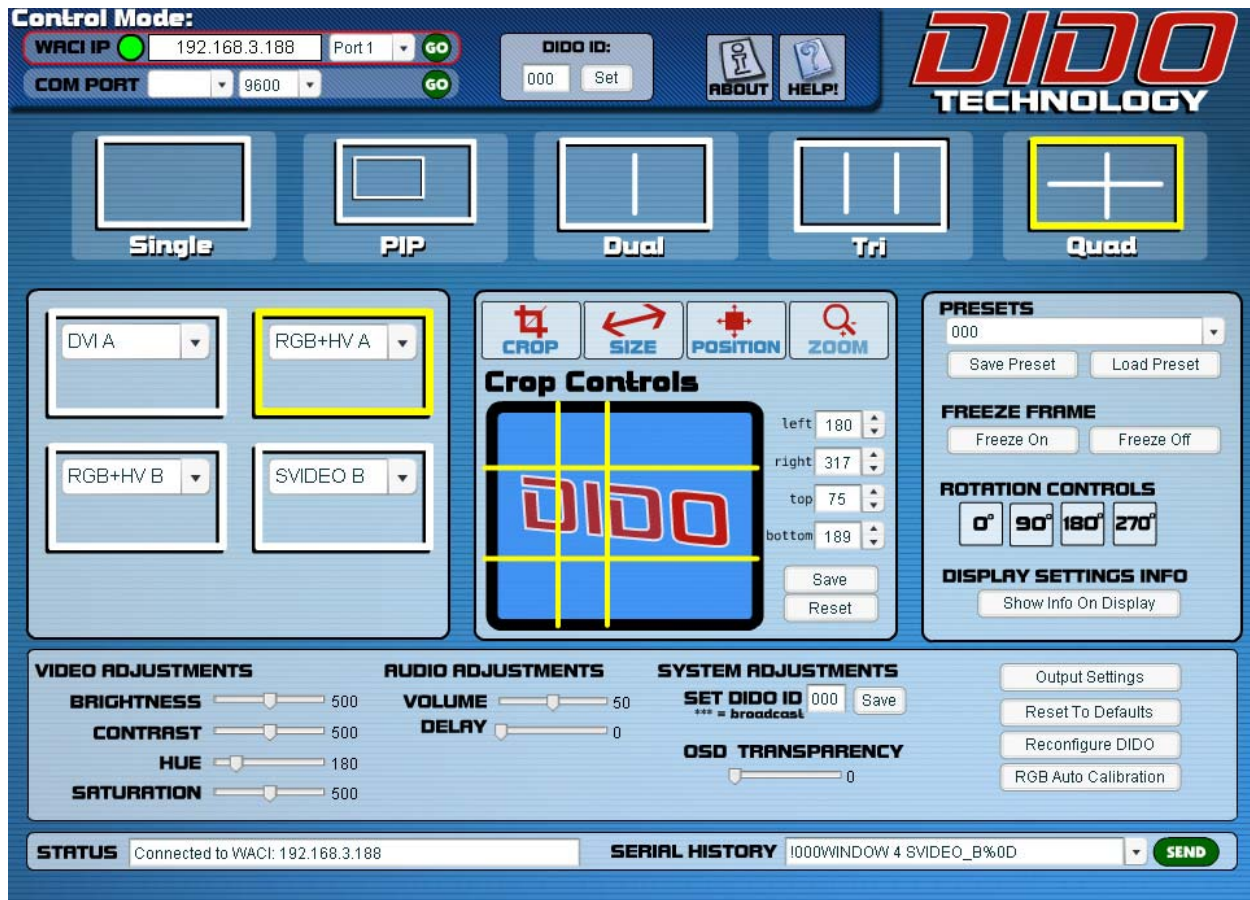
Aurora Multimedia has developed control software for use with the DIDO Jr. to make control of the unit even easier. This firmware is available free of charge on the Aurora website www.auroramultimedia.com It can be found in the DIDO Jr. section under products.

The software is written in Flash as an executable file to be run from a PC's communication port and can also be run from Aurora WACI control systems.

The latest features and instructions of use can be found using the Help button at the top of the page. The About button will reveal the Control Software's revision number. Always make certain the DIDO Jr. is running the latest firmware to take advantage of new features.

8 Troubleshooting

Symptom	Checks
Key on remote is pressed but nothing happens	Check to see if the batteries are good. If the batteries are good – check the cable connections between the Plasma Display and the DIDO Jr. Also, make certain the DIDO Jr. has power. Check if the IR remote address is the same as the DIDO Jr.'s address in System Setup menu.
The display does not turn on or show an image	Check to see if the OSD from the DIDO Jr. displays. If it does check the source selection and/or cables for the source. If there is no OSD then make certain the output cable is connected properly and the output timing of the DIDO Jr. matches the capabilities of the display device. Make sure the DIDO Jr. is not in standby.
No control via RS-232 connection to DIDO Jr.	Check cable connection. If connection is ok, check baud rate and address of DIDO Jr.
DVI output has horizontal noise going across intermittently	This could happen if a DVI cable is too long. Typical DVI should not exceed 6ft. Some after market products can enhance the length of DVI. Double check the specifications before using these types of DVD cables.
Video is black and white	Under Input Settings, check the selection for the SVID. If the video sync is weak try using video selection instead of Auto. Also, make certain it is not set for S-Video.
S-Video does not lock	Under Input Settings check the selection for the SVID. Make certain the selection is not set for Video.
DVI has output but RGB does not	If the content has HDCP, the RGB/YPbPr output will be disabled due to copyright protection. If it is not HDCP protected, heck the Output Setup to make certain RGB is not disabled.
No image on either output	Check output resolution is compatible with display device and the DIDO Jr. is not in standby mode.
Image is green on the input	Make certain the DIDO Jr. input for RGB/YPbPr is set up correctly.
Image is green on the output	If the output of the DIDO Jr. is setup incorrectly (RGBHV vs YPbPr vs RGsB) it may result in a green image.
Tri Mode does not work	DIDO Jr. does not have this feature. Must use regular DIDO if this feature is desired.
Quad Mode does not work	DIDO Jr. does not have this feature. Must use regular DIDO if this feature is desired.
Side B input keys do not work	DIDO Jr. does not have the additional inputs. Must use regular DIDO if this feature is desired.

11 Firmware update

The internal software of DIDO Jr. (the firmware) can be updated. This is necessary since new FW will correct bugs from previous versions or add new functionalities. The serial port of the DIDO Jr. must be connected to the RS-232 ("COM") port of a PC-compatible personal computer, running MS-Windows 98, 2000, or XP operating systems. Make certain to set the baud rate to 115k, unit address to 0, and back up the settings before updating firmware. Always check the serial number on the DIDO Jr. unit to make sure the new firmware is compatible with the hardware revision. Some features may not work depending on DIDO Jr. model, which is determined by the four digit batch number (example: bbbb-SNxxxx with "bbbb" representing the batch number).

Update procedure
- Create a directory for the DIDO Jr. (such as C:\DIDO).
- Save the attached files to the created directory.
- Unzip the files if necessary.
- Open a Win32 (Command Prompt) window (Start → Run → cmd → Enter).
- Change to DIDO Jr. directory (C:\DIDO).
- Type this command "DIDOldr.exe 1 DIDO.did" and press "Enter." (Note: To change the COM port use the appropriate comm. port number in place of the 1)
- It will take approximately 20 seconds to finish programming and the device will restart itself. If it does not restart, unplug the power and re-apply it after 5 seconds.
- Under System Settings select Default Settings and confirm.

Important: avoid programming the DIDO Jr. using USB-RS232 adapter since it may not work properly.

Example:
"DIDOldr.exe 1 DIDOJr.did"
DIDO.ldr.exe: program loader
1: COM port used to program the DIDO Jr. (for example, 2 is for COM 2)
DIDOJr.did: firmware (this file name can be anything such as DIDOJr040916.did)

Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\DIDO >DIDOldr.exe 1 DIDOJr.did
DIDO Jr. firmware loader V2.03 Copyright (c) 2003 Aurora Multimedia
Loading "DIDOJr.did"
Opening Com 1...   OK
Initiating bootblock.....   OK
Initiating load procedure...   OK
Transferring image header...   OK
Waiting for header response...   OK
Erasing flash...   OK
Loading flash image (137674 bytes)... 100%   OK
Rebooting device...

Warning:
In the event the firmware update is interrupted during the transfer process, cycle the power on the DIDO Jr. and wait 30 sec after reapplying the power to start the transfer process again. The LCD screen may be blank but that is normal if this should happen.

12 Cloning

The DIDO Jr. can be cloned to save and restore all current parameters.

There are two steps involved in cloning procedure. They are:

1. **Learning** or downloading data (settings) from DIDO Jr. to the computer.
2. **Teaching** or uploading data (settings) from computer to the DIDO Jr.

Before cloning the DIDO Jr., a folder which will be used to store data from the master DIDO Jr. needs to be created (for example: C\DIDO Jr.\data). The clone utility (CloneLdr.exe) will be saved to that directory.

Important: DIDO Jr. may not be cloned properly if a USB to RS 232 adapter is used.

Command lines for learning and teaching:

Learning: CloneLdr.exe COM[Port#] /l File_Name.par
Teaching: CloneLdr.exe COM[Port#] /s File_Name.par

CloneLdr.exe: clone utility.
COM[Port#]: serial port (such as 1 or 2) that is used for cloning.
/l: loading data from DIDO Jr. to the computer.
/s: sending data from computer to the DIDO Jr.
File_Name.par: name of the file that will be used to store data from DIDO Jr.

13 RS-232 Protocol

Serial Control Setup: 115k 8N1 (Default)
Baud Rate: 2400 – 115k (Selectable).
Serial Connector Type: 9 to 6 pin RS 232 cable (NULL).
Note: this cable is supplied by the manufacturer.

The DIDO Jr. is addressable. Units will be addressable from 000-254.
Address 255 or *** is reserved for broadcasting.

COMMAND FORMAT:

<div align="center">

[**Prefix**][**Address**][**Command**][**n**][**m**] [<**CR**>]

</div>

?	**QUERY COMMAND**	(Does not have to be Case Sensitive)
!	**COMMAND**	(Does not have to be Case Sensitive)
~	**RESPONSE**	(ALL RESPONSES ARE CAPITALS)
ADDRESS	000 – 254	(255 or *** is used for Broadcasting)
COMMAND	**ASCII FORMAT**	(See Command List)
n, m:	variables	
<CR>	**0D** (hex) or **13** (decimal)	

Note:

      If a command doesn't require variable(s), then nothing should be entered.
      If a command does have variable(s), the response will include variable(s).

Example:

    !001KEY_ZOOM<CR>   Will tell unit addressed at 001 to carry out the Zoom command.
    ~001KEY_ZOOM<CR> Response from the DIDO Jr..

    !***KEY_POWER<CR> Will tell all units to toggle the power.

    !000HPOSIT <n> <CR> Set horizontal position at n.

    ~000HPOSIT <n> <CR> Response from DIDO Jr..

COMMAND LIST:

!	COMMANDS	FUNCTION	NOTE
1	KEY_P1	PRESET 1	
2	KEY_P2	PRESET 2	
3	KEY_P3	PRESET 3	
4	KEY_P4	PRESET 4	
5	KEY_NUM0	NUMBER 0	
6	KEY_NUM1	NUMBER 1	
7	KEY_NUM2	NUMBER 2	
8	KEY_NUM3	NUMBER 3	
9	KEY_NUM4	NUMBER 4	
10	KEY_NUM5	NUMBER 5	

!	COMMANDS	FUNCTION	NOTE
11	KEY_NUM6	NUMBER 6	
12	KEY_NUM7	NUMBER 7	
13	KEY_NUM8	NUMBER 8	
14	KEY_NUM9	NUMBER 9	
15	KEY_LEFT	LEFT ARROW	
16	KEY_RIGHT	RIGHT ARROW	
17	KEY_UP	UP ARROW	
18	KEY_DOWN	DOWN ARROW	
19	KEY_SEL	SELECT	
20	KEY_MENU	MENU	
21	KEY_EXIT	EXIT	
22	KEY_POWER	POWER TOGGLE	
23	KEY_MUTE	Not Available	
24	KEY_INFO	INFORMATION	
25	KEY_ROTATE	ROTATE	
26	KEY_ZOOM	ZOOM	
27	KEY_CROP	CROP	
28	KEY_POS	POSITION	
29	KEY_SIZE	SIZE	
30	KEY_A_DVI	DVI INPUT	
31	KEY_A_RGB	RGB INPUT	
32	KEY_A_VIDEO	VIDEO/SVIDEO INPUT	
33	KEY_B_DVI	Not Available	
34	KEY_B_RGB	Not Available	
35	KEY_B_VIDEO	Not Available	
36	KEY_SINGLE	SINGLE MODE	
37	KEY_DUAL	DUAL MODE	
38	KEY_TRI	Not Available	
39	KEY_QUAD	Not Available	
40	KEY_FREEZE	FREEZE	
41	KEY_SWAP	SWAP WINDOW SOURCES	
42	SETDEFAULT	FACTORY DEFAULTS	
43	PRESET n	RECALL PRESET	n = 00 to 99
44	S_PRESET n	STORE PRESET	n = 00 to 99
45	RSADDR n	SET ADDRESS	n = 000 to 254 (255 or ***: Broadcast)
46	WINDOW n m	SELECT WINDOW	n = 1, 2; m: input*
47	ROTATE n	ROTATE OUTPUT	Degree of rotation: 90*(n); n = 0, 1, 2, 3
48	LAYOUT m	SET LAYOUT	m = single, dual, pip, sbs
49	OUTFORMAT n	OUTPUT RESOLUTION	n = output resolution**
50	HPOSIT n m	SET H. POSITION	n (window):1, 2; m = 0 to 1000
51	VPOSIT n m	SET V.POSITION	n (window):1, 2; m = 0 to 1000
52	HSIZE n m	SET H.SIZE	n (window):1, 2; m = 0 to 1000

!	COMMANDS	FUNCTION	NOTE
53	VSIZE n m	SET V.SIZE	n (window):1, 2; m = 0 to 1000
54	SWAPIN	SWAP INPUTS	Swap inputs from window 1 and 2
55	RECONFIG	RECONFIGURE DIDO Jr.	
56	HPOSITPIP n	SET H.POS FOR PIP	n = 0 to 1000
57	VPOSITPIP n	SET V.POS FOR PIP	n = 0 to 1000
58	HSIZEPIP n	SET H.SIZE FOR PIP	n = 0 to 1000
59	VSIZEPIP n	SET V.SIZE FOR PIP	n = 0 to 1000
60	RGBSYNC n m	RGB/YPbPr TYPE	n = A; m = HV, SOG, YPRPB
61	SWAPWIN	SWAP INPUT	Swap window 1 and 2 only (sbs, pip)
62	POWERON	POWER ON	
63	POWEROFF	POWER OFF	
64	MUTEON	Not Available	
65	MUTEOFF	Not Available	
66	VOLUME+	Not Available	
67	VOLUME-	Not Available	
68	VOLUME n	Not Available	n is value in percent
69	AUDIOINPUT n	Not Available	n is SOUND_A, SOUND_B, SPDIF_A, SPDIF_B
69	AUDIOOUTPUT n	Not Available	n ANALOG, SPDIF
70	AUDIODELAY n	Not Available	n is value in percent
71	OSDTRANS n	OSD TRANSLUCENCY	n is value in percent
72	PIPTRANS n	PIP TRANSLUCENCY	n is value in percent
73	ADCCALIBR	A/D RGB Auto Calibration	
74	FREEZE n	FREEZE OUTPUT IMAGES	n is 0 for off, 1 for on
75	BRIGHTNESS n	BRIGHTNESS CONTROL	n = 0 to 1000
76	CONTRAST n	CONTRAST CONTROL	n = 0 to 1000
77	SATURATION n	SATURATION CONTROL	n = 0 to 1000
78	HUE n	HUE CONTROL	n = 0 to 1000
79	ZOOM n m	ZOOM	n (window): 1,2; m = 0 to 1000
80	CROPLEFT n m	CROP LEFT	n (window):1, 2; m = pixels
81	CROPRIGHT n m	CROP RIGHT	n (window):1, 2; m = pixels
82	CROPTOP n m	CROP TOP	n (window):1, 2; m = pixels
83	CROPBOTTOM n m	CROP BOTTOM	n (window):1, 2; m = pixels
84	CROPSAVE n	CROP SAVE	n (window):1, 2
85	CROPRESET n	CROP RESET	n (window):1, 2
86	OSDON	OSD ON	
87	OSDOFF	OSD OFF	
88	VERFLIPON	VERTICAL FLIP ON	
89	VERFLIPOFF	VERTICAL FLIP OFF	
90	HORFLIPON	HORIZONTAL FLIP ON	
91	HORFLIPOFF	HORIZONTAL FLIP ON	
92	STACK n	STACK DIRECTION	n = UD, LR

*   Inputs: DVI_A, RGB_A, SVIDEO_A
**   Output resolutions:

0	VGA 60Hz	11	SXGA 60Hz	22	USER 02
1	VGA 72Hz	12	SXGA 75Hz	23	USER 03
2	VGA 75Hz	13	SXGA 85Hz	24	USER 04
3	SVGA 60Hz	14	WXGA 60Hz	25	USER 05
4	SVGA 72Hz	15	UXGA 60Hz	26	USER 06
5	SVGA 75Hz	16	WVGA 60HZ	27	USER 07
6	XGA 60Hz (806 Pixels)	17	480P	28	USER 08
7	XGA 60Hz (807 Pixels)	18	576P	29	USER 09
8	XGA 70Hz	19	720P	30	USER 10
9	XGA 75Hz	20	1080P	31	
10	XGA 85Hz	21	USER 01	32	

QUERY COMMAND LIST:

?	COMMANDS	FUNCTION	NOTE
1	RSADDR	ADDRESS	
2	OUTFORMAT	OUTPUT FORMAT	
3	HPOSIT n	H.POSITION	n (window): 1,2
4	VPOSIT n	V.POSITION	n (window): 1,2
5	HSIZE n	H.SIZE	n (window): 1,2
6	VSIZE n	V.SIZE	n (window): 1,2
7	HPOSITPIP	PIP H.POSITION	
8	VPOSITPIP	PIP V.POSITION	
9	HSIZEPIP	PIP H.SIZE	
10	VSIZEPIP	PIP V.SIZE	
11	VER	FW VERSION	
12	PRESET	PRESET	
13	VOLUME	Not available	
14	BRIGHTNESS	BRIGHTNESS	
15	CONTRAST	CONTRAST	
16	SATURATION	SATURATION	
17	HUE	HUE	
18	ZOOM n	ZOOM	n (window): 1,2
19	INFO	INFORMATION	See below for detailed response info
20	CROPLEFT n	CROP LEFT PIXELS	n (window): 1,2
21	CROPRIGHT n	CROP RIGHT PIXELS	n (window): 1,2
22	CROPTOP n	CROP TOP PIXELS	n (window): 1,2
23	CROPBOTTOM n	CROP BOTTOM PIXELS	n (window): 1,2
24	FLIP	FLIP MODE	
25	STACK	STACK MODE	

Info Query:
Below is a typical response from an Info query. The information line starts with # followed by the information. This structure and text will change based on the amount of windows displayed and the type of sources and resolutions supplied.

```
# Window: 1
#  Input : DVI_B, SXGA 60Hz, 1280x1024
# Window: 2
#  Input : RGB+HV, no signal
# Mode  : SbS
# Rotate: No
# Output: XGA 60Hz, 1024x768, DVI/RGB+HV,
# DIDO Jr. address : 0
# Version: 1.11, Rev: 8649, Date: 29-Aug-2005
```

General Info:

After each command you need to wait for the following answer "~<ADDR> OK <string><CR>" before sending the next RS-232 command. Some commands require time to carry out the function assigned. If another command is sent before the DIDO Jr. can complete the first task it may ignore the next function. Always allow the DIDO Jr. the proper time to finish the command. Commands which take the longest would be Preset Load and Save and Source changes.

Invalid commands will reply with ~ERROR<CR> as long as the address is zero.
Convert the multi-digit ASCII decimal representation response to a true hexadecimal value. Ex. xx = 13 (0x31, 0x33) turn this into 0D. The bit information is once the ASCII to hexadecimal conversion has been done.

14 Specifications

14.1 Supported Video Timing

Input Format	Horiz. Freq. (KHz)	Vertical Freq. (Hz)	Active Resolution	Total Resolution	Pixel Clock (MHz)
525/60 NTSC, ITU-R BT601-5, RS-170M	15.75/1.001	60.0/1.001	720x480 @ 59.94i	858x525	13.500
525/60 NTSC, CCIR 656	15.75/1.001	60.0/1.001	720x480 @ 59.94p	858x525	27.000
625/50 PAL/SECAM, ITU-R BT601-5	15.625	50.000	720x576 @ 50.00i	864x625	13.500
625/50 PAL/SECAM, CCIR 656	15.625	50.000	720x576 @ 50.00i	864x625	27.000
480p 4:3, SMPTE 293M	31.5/1.001	60.0/1.001	720x483 @ 59.94p	858x525	27.000
720p, SMPTE 296M	45.0/1.001	60.0/1.001	1280x720 @ 59.94p	1650x750	74.25/1.001
1080i, SMPTE 274M	33.750/1.001	60.0/1.001	1920x1080 @ 59.94i	2200x1125	74.25/1.001
1080p, SMPTE	67.4	60.0/1.001	1920x1080 @ 59.94p	2200x1125	74.25/1.001

Note: DIDO Jr. will accept interlaced signals but will not output interlaced signals. Interlaced inputs will be de-interlaced and displayed as a high quality progressive signal.

Supported Default DVI/RGB PC Graphics Input & Output Timing

Mode	Resolution	Horizontal Frequency	Vertical Frequency	Pixel Clock (Mhz)
VGA	640x480 @ 60 Hz 800x525	31.469	59.940	25.175
VGA	640x480 @ 72 Hz 832x520	37.861	72.809	
VGA	640x480 @ 75 Hz 840x500	37.500	75.000	
WVGA	852x480 @ 60Hz 1072x529	31.700	60.000	
SVGA	800x600 @ 60 Hz 1056x628	37.879	60.317	40.000
SVGA	800x600 @ 72 Hz 1040x666	48.077	72.188	
SVGA	800x600 @ 75 Hz 1056x625	46.875	75.000	
XGA	1024x768 @ 60 Hz 1344x806	48.363	60.004	65.000
XGA	1024x768 @ 70 Hz 1328x806	56.476	70.069	
XGA	1024x768 @ 75 Hz 1312x800	60.023	75.029	
XGA	1024x768 @ 85 Hz 1376x808	68.600	85.000	
WXGA	1280x768 @ 60 Hz 1688x802	48.134	60.017	81.25
WXGA	1360x768 @ 60 Hz			
WXGA	1366x768 @ 60 Hz			
SXGA	1280x1024 @ 60 Hz 1688x1066	63.900	60.000	
SXGA	1280x1024 @ 75 Hz 1688x1066	79.900	75.000	
SXGA	1280x1024 @ 85 Hz 1728x1072	91.100	85.000	
UXGA	1600x1200 @ 60 Hz 2160x1250	76.900	60.000	
WUXGA	1900x1200 @ 60 Hz			

Note: DIDO Jr. has the ability to program additional resolutions in User profiles. This can be found in the Signal Timing OSD section.

14.2 Power source

12v 14.4 Watt DC wall supply
2.1mm Power Connector (12 volts)
Center is Positive - Outer Shell is Ground

14.3 Connection terminals

1 S-Video Inputs (Mini DIN 4pin)
1 DVI-I Inputs for 1 DVI-D inputs and 1 RGBHV/YPbPr inputs
1 Control Input for RS-232 and RS-485 (Connecting Multiple Units)

S-Video/Composite 4 Pin Mini-DIN Connector:

1 Y Ground
2 C Ground
3 Y Intensity (Luminance) or Composite
4 C Color (Chrominance)

Control Port:

RS232 - Pins 1, 3, 5
>> Pin 1: Ground   Pin 3 - TX   Pin 5 – RX

RS-485 – Pins 1, 4, 6 (Used for looping multiple DIDO Jr. units)
>> Pin 1:   Ground
>> Pin 4:   485+
>> Pin 6:   485-

When connecting multiple units, the first unit will have the RS-232 connected. Then its 485+, 485-, and ground, are connected parallel to all other DIDO Jr. RS-485 ports. Aurora has made available DIDO LOOP KIT which makes this task easier to connect.

Example of multiple DIDO Jr. units connected together via RS-485 and controlled from a PC.

```
PC (DB9)      DIDO Jr. 1            DIDO Jr. 2            DIDO Jr. 3
5 ---------------- 1 ----------------- 1 ----------------- 1
                   2              2              2
2 ---------------- 3              3              3
                   4 ----------------- 4 ----------------- 4
3 ---------------- 5              5              5
                   6 ----------------- 6 ----------------- 6
```

DIDO Jr. 1 has Address set to 0
DIDO Jr. 2 has Address set to 1
DIDO Jr. 3 has Address set to 2

14.4 Dimensions

Height: 1"
Depth: 5.65"
Length: 8.4"

14.5 Weight

Approx. 2.5 lbs for DIDO Jr. unit and 4.3 lbs with all accessories and boxed

15 Limited Lifetime Warranty

Aurora Multimedia Corp. ("Manufacturer") warrants that this product is free of defects in both materials and workmanship for the product lifetime as defined herein for parts and labor from date of purchase. This Limited Lifetime warranty covers products purchased in the year of 2003 and after. Product lifetime is defined as 7 years from discontinuance of product. Motorized mechanical parts (Hard Drives, DVD, etc), mechanical parts (buttons, doors, etc), remotes and cables are covered for a period of 1 year. Touch screen displays are covered for 1 year; touch screen overlay components are covered for 90 days. Supplied batteries are not covered by this warranty. During the warranty period, and upon proof of purchase, the product will be repaired or replaced (with same or similar model) at our option without charge for parts or labor for the specified product lifetime warranty period.

This warranty shall not apply if any of the following:
A) The product has been damaged by negligence, accident, lightning, water, act-of-God or mishandling; or,
B) The product has not been operated in accordance with procedures specified in operating instructions: or,
C) The product has been repaired and or altered by other than manufacturer or authorized service center; or,
D) The product's original serial number has been modified or removed: or,
E) External equipment other than supplied by manufacturer, in determination of manufacturer, shall have affected the performance, safety or reliability of the product.
F) Part(s) are no longer available for product.

In the event that the product needs repair or replacement during the specified warranty period, product should be shipped back to Manufacturer at Purchaser's expense. Repaired or replaced product shall be returned to Purchaser by standard shipping methods at Manufacturer's discretion. Express shipping will be at the expense of the Purchaser. If Purchaser resides outside the contiguous US, return shipping shall be at Purchaser's expense.

No other warranty, express or implied other than Manufacturer's shall apply.

Manufacturer does not assume any responsibility for consequential damages, expenses or loss of revenue or property, inconvenience or interruption in operation experienced by the customer due to a malfunction of the purchased equipment. No warranty service performed on any product shall extend the applicable warranty period.

This warranty does not cover damage to the equipment during shipping and Manufacturer assumes no responsibility for such damage.

This product warranty extends to the original purchaser only and will be null and void upon any assignment or transfer.

16 FCC Part 15 Statement

RADIO AND TELEVISION INTERFERENCE
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
    - Reorient or relocate the receiving antenna.
    - Increase the separation between the equipment and the receiver.
    - Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
    - Consult the dealer or an experienced radio/TV technician for help.
You may also find helpful the following booklet, prepared by the FCC: "How to Identify and Resolve Radio-TV Interference Problems." This booklet is available from the U.S. Government Printing Office, Washington D.C. 20402.
Changes and Modifications not expressly approved by the manufacturer or registrant of this equipment can void your authority to operate this equipment under Federal Communications Commissions rules.
In order to maintain compliance with FCC regulations shielded cables must be used with this equipment. Operation with non-approved equipment or unshielded cables is likely to result in interference to radio & television reception.

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